

Patent claims

1. A process for preparation of homopolymers composed of oxiranes, or of copolymers composed of oxiranes and comonomers, via anionic polymerization, which comprises carrying out a polymerization in the presence of a quaternary ammonium and/or phosphonium compound and of a mononuclear organylaluminum compound of the formula R_3-Al , where the radicals R are, independently of one another, hydrogen, halogen, C_{1-20} -alkyl, C_{6-20} -aryl, or C_{7-20} -arylalkyl.
2. The process according to claim 1, wherein the oxiranes have been selected from propylene oxide, ethylene oxide, and mixtures of these.
3. The process according to claims 1 to 2, wherein the comonomers have been selected from styrene, α -methylstyrene, butadiene, isoprene, and mixtures of these.
4. The process according to claims 1 to 3, wherein the quaternary ammonium or phosphonium compound has the formula NR_4-X or PR_4-X , where R is identical or different alkyl having from 1 to 10 carbon atoms, and X is halogen, OH, or an alcoholate radical having from 1 to 10 carbon atoms.
5. The process according to claims 1 to 4, wherein trialkylaluminum compounds are used as organylaluminum compound.
6. The process according to claims 1 to 5, wherein the molar ratio of organylaluminum compound to quaternary ammonium or phosphonium compound, calculated as aluminum atoms to nitrogen atoms or phosphorus atoms, is from 1.5:1 to 100:1.
7. The process according to claims 1 to 6, wherein the quaternary ammonium or phosphonium compound is added first and then the organylaluminum compound is added.
8. The process according to claims 1 to 7, wherein the copolymers are block copolymers, and sequential polymerization is first used to polymerize the comonomer to give a polymer block B, and then the oxirane is polymerized to give a polyoxirane block A.
9. The process according to claim 8, wherein concomitant use is made of an alkali metal compound during the polymerization of the polymer block B.

10. The process according to claims 1 to 9, wherein polymerization is carried out in the presence of a quaternary ammonium compound and of a mononuclear organylaluminum compound.